



PATENT  
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: : Docket: ANO 6119/3156  
PERSSON, et al. : Examiner: Peter Chin  
Serial No. 10/007,885 : Group Art Unit: 1731  
Filing Date: November 5, 2001 :  
For: SILICA-BASED SOLS :

Assistant Commissioner for Patents  
Washington, D.C. 20231

DECLARATION UNDER 37 C.F.R. §1.132

Sir:

I, Hans E. Johansson Vestin, do hereby declare and say that:

1. I am a citizen of Sweden residing at Madängsgatan 5, SE-442 33 Kungälv, Sweden. Previously, my name was Hans E. Johansson but in 1997, I added my wife's family name Vestin to my family name Johansson.
2. I have a degree of Doctor of Philosophy, chemistry, from the Chalmers University of Technology in Gothenburg, Sweden.
3. I am a Senior Research Scientist employed by Eka Chemicals AB, formerly Eka Nobel AB and Eka AB, in Sweden since 1973, and since 1979 I have been continually involved in research and development concerning drainage and retention aids, including silica-based sols, for use in papermaking.
4. I have read and understood the specification of U.S. Patent Application Serial No. 10/007,885 ("the present application") relating to silica-based sols.

5. I have also read and understood the specifications of U.S. Patent Nos. 5,277,764 (Johansson et al; "the '764 patent"), 5,607,552 (Andersson et al; "the '552 patent") and 6,486,216 ("Keiser et al") cited in the present application. I am a co-inventor of the '764 and '552 patents.

6. The '764 patent discloses a process for the production of cellulose fibre containing products in sheet or web form from a suspension of cellulose containing fibres, and optional fillers, which comprises forming and dewatering of the suspension on a wire and drying whereby anionic inorganic particles and a cationic carbohydrate polymer are added to the suspension.

The anionic inorganic particles can be silica-based particles and the '764 generally discloses sols of colloidal silica-based particles. However, the '764 patent is silent about the viscosities of the silica-based sols.

7. The '552 patent discloses aqueous stable suspension of colloidal particles, wherein the particles are both silica-based anionic particles and hydrated particles of clays of smectite type which are expandable in water, whereby the weight ratio of silica based particles to clay particles is within the range of from 20:1 to 1:10 and the dry content of the suspension is within the range of from 5 to 40 per cent by weight.

The '552 patent further generally discloses sols of colloidal silica-based particles. However, the '552 patent is silent about the viscosities of the silica-based sols.

8. Keiser et al discloses stable aquasols comprising colloidal silica having a surface area of from about 700 m<sup>2</sup>/g to about 1100 m<sup>2</sup>/g, and an S-value of from about 20 to about 50; wherein said colloidal silica is not surface treated; wherein the molar ratio of SiO<sub>2</sub>:Na<sub>2</sub>O in said colloidal silica is greater than about 13.0:1 and is less than about 17.0:1; and wherein said aquasols have a percent by weight SiO<sub>2</sub> solids level of from about 7.00 percent to about 16.80 percent.

However, Keiser et al is silent about, inter alia, the viscosities of the aquasols.

9. Aqueous sols containing silica-based particles, also referred to herein as aqueous silica-based sols, can be characterized by means of many different parameters. Examples of such parameters include S-value; content of silica; contents of various elements like alkali metals and aluminium; viscosity; density; pH; whether, how and to what extent the sols or silica-based particles have been modified by means of various elements or compounds; particle size and specific surface area of the silica-based particles; etc.

Some of the parameters of aqueous sols containing silica-based particles are independently changeable whereas others are not. For two parameters that are independently changeable, a change in one parameter will not affect the other. For two parameters that are not independently changeable, a change in one parameter will result in a change in the other. However, the resulting change need not be proportional. In addition, if one or even two parameters of an aqueous sol containing silica-based particles are known, it is most often impossible to predict the value of other parameters of the aqueous sol. Furthermore, some parameters of an aqueous sol containing silica-based particles may be independently changeable within certain ranges, even if these parameters are not completely independently changeable.

In an Office Action mailed December 15, 2004 in respect of the present application, it is stated "since viscosity is dependent on such factors as particle size and surface area, it is obvious that since the S-values and specific surface area of the above prior art sols are within the claimed range, the prior art obviously encompasses the claimed viscosity".

It is correct that viscosity is dependent on such factors as particle size and surface area. However, in my professional opinion, it is not correct that since the S-values and specific surface area of the above prior art sols are within the claimed range, the prior art obviously encompasses the claimed viscosity. My opinion is based on the fact that viscosity depends on several factors, or parameters of an aqueous silica-based sol, not only S-values and specific surface area. As a consequence, it is certainly possible that the aqueous sol containing silica-based particles according to the present application has a viscosity which is different, even to a large extent, from the viscosity of prior art sols, even if the S-values and specific surface areas are within the same range.

10. In my professional opinion, the '764 and '552 patents and the Keiser et al references do not teach, suggest or disclose, either explicitly or implicitly, an aqueous sol containing silica-based particles, which sol has an S-value within the range of from 10 to 45%; a viscosity within the range of from 5 to 40 cP; a molar ratio of SiO<sub>2</sub> to M<sub>2</sub>O, where M is alkali metal or ammonium, within the range of from 10:1 to 40:1; and the silica-based particles have a specific surface area within the range of from 550 to 725 m<sup>2</sup>/g.

11. In my professional opinion, the '764 and '552 patents and the Keiser et al references do not teach, suggest or disclose, either explicitly or implicitly, an aqueous sol containing silica-based particles, which sol has an S-value within the range of from 10 to 45%; a viscosity within the range of from 5 to 40 cP; and a silica content of at least 10% by weight; and the silica-based particles have a specific surface area within the range of from 550 to 725 m<sup>2</sup>/g.

12. In my professional opinion, the '764 and '552 patents and the Keiser et al references do not teach, suggest or disclose, either explicitly or implicitly, an aqueous sol containing silica-based particles, which sol has an S-value within the range of from 10 to 45%; a viscosity within the range of from 7 to 25 cP; a silica content of at least 10% by weight; a molar ratio of SiO<sub>2</sub> to M<sub>2</sub>O, where M is alkali metal or ammonium, within the range of from 10:1 to 40:1; and a pH of at least 10.6.

13. In my professional opinion, the '764 and '552 patents and the Keiser et al references do not teach, suggest or disclose, either explicitly or implicitly, an aqueous sol containing silica-based particles, which sol has an S-value within the range of from 10 to 45%; a viscosity within the range of from 5 to 40 cP; a silica content of at least 10% by weight; and a molar ratio of SiO<sub>2</sub> to M<sub>2</sub>O, where M is alkali metal or ammonium, within the range of from 10:1 to 40:1; and the sol is modified by an aluminium-containing compound, a boron-containing compound or a mixture thereof.

14. In my professional opinion, the '764 and '552 patents and the Keiser et al references do not teach, suggest or disclose, either explicitly or implicitly, an aqueous sol containing silica-based particles, which sol has an S-value within the range of from 20 to 40%; a viscosity within the range of from 7 to 25 cP; pH of at least 10.6; molar ratio of SiO<sub>2</sub> to M<sub>2</sub>O, where M is alkali metal or ammonium, within the range of from 15:1 to 30:1; silica content of at least 10% by weight; and colloidal anionic silica-based particles with a specific surface area within the range of from 550 to 1050 m<sup>2</sup>/g.

15. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: June 14, 2005

Name: Hans Johansson Vestin  
Hans E. Johansson Vestin